DOCUMENT RESUME

ED 472 486 UD 035 475

AUTHOR	Schwartz, Wendy
TITLE	Class Size Reduction and Urban Students. ERIC Digest.
INSTITUTION	ERIC Clearinghouse on Urban Education, New York, NY.
SPONS AGENCY	Office of Educational Research and Improvement (ED), Washington, DC.
ISSN	ISSN-0889-8049
PUB DATE	2003-02-00
NOTE	4p.; Digest Number 182.
CONTRACT	ED-99-CO-0035
AVAILABLE FROM	ERIC Clearinghouse on Urban Education, Institute for Urban and Minority Education, Box 40, Teachers College, Columbia University, New York, NY 10027. Tel: 800-601-4868 (Toll Free). Web site: http://www.eric-web.tc.columbia.edu.
PUB TYPE	ERIC Publications (071) -- ERIC Digests in Full Text (073) -- Reports - Descriptive (141)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Academic Achievement; *Class Size; Educational Change; Elementary Secondary Education; Minority Group Children; Poverty; *Small Classes; State Programs; *Urban Schools
IDENTIFIERS	Achievement Gap; California; *Class Size Reduction; ERIC Digests; Reform Efforts; Tennessee; Wisconsin

ABSTRACT

Researchers have long investigated whether smaller classes improve student achievement. Their conclusions suggest that class size reduction (CSR) can result in greater in-depth coverage of subject matter by teachers, enhanced learning and stronger engagement by students, more personalized teacher-student relationships, and safer schools with fewer discipline problems. In 1999, Congress began appropriating funds so schools could hire additional teachers and invest in other CSR measures. About half of the states have begun to reduce K-3 class size. One of the main goals of CSR is to close the achievement gap between white middle class students and poor students of color. This digest reviews recent research findings on the CSR experiences in Tennessee, Wisconsin, and California. The following recommendations for maximizing the benefits of CSR are presented: CSR should be integrated with other school reform efforts, including standards-based policies; CSR should be first implemented as a trial in selected districts, preferably in low-income areas and with large minority student populations, before a large-scale rollout is attempted; and additional funds should be allocated for extra resources for students of color and with low income, including placement in even smaller classes. (Contains 11 references.) (SM)

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ED 472 486

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ERIC Digest Number 182

Wendy Schwartz

ERIC Clearinghouse on Urban Education
Institute for Urban and Minority Education
Teachers College, Columbia University

February 2003
EDO-UD-03-1
ISSN 0889-8049

UD 035 475

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CLASS SIZE REDUCTION AND URBAN STUDENTS

Researchers have long investigated whether smaller classes improve student achievement. Their conclusions suggest that class size reduction (CSR) can result in greater in-depth coverage of subject matter by teachers, enhanced learning and stronger engagement by students, more personalized relationships between teachers and students, and safer schools with fewer discipline problems (Cohen, Miller, Stonehill, & Geddes, 2000; Hertling, Leonard, Lumsden, & Smith, 2000; Thompson & Cunningham, 2001). Thus, in 1999 Congress began appropriating funds so that schools could hire additional teachers and invest in other CSR measures. Federal CSR funds for the 2001-2 school year totalled $1.6 billion, and allocations are now included in the No Child Left Behind Act of 2001 (*Class Size Reduction*, 2002).

About half of the states have begun to reduce the size of their kindergarten through third grade classes, the grades shown to be most sensitive to the positive effects of small classes (Hertling et al., 2000). One of the main goals of CSR is closing the achievement gap between white middle-class students and poor students of color. Several states have undertaken major CSR initiatives, and these efforts have been rigorously evaluated to determine their costs and effects on students, teachers, and the education system as a whole. This digest briefly reviews recent research findings on the CSR experience and summarizes researchers' recommendations for program improvements.

Major Class Size Reduction Initiatives

The CSR initiatives described below were selected because they have been in operation long enough to provide meaningful results, have been studied extensively, and represent a cross-section of approaches to reducing class size.

Tennessee

The statewide CSR program of longest duration is Tennessee's Project STAR (Student/Teacher Achievement Ratio), which was begun as an experiment to be carefully researched. STAR was begun in 1985 with the random assignment of some kindergartners to classes of 13-17 students, and the remaining kindergartners to one of two control groups: classes of up to 26 students with only a teacher, and 26-student classes with a teacher and an aide (Finn, 1998).

Study findings demonstrated consistently that STAR participants scored higher on achievement tests than the students in the control groups and that the benefits were greater—often significantly so—for minority students than white students, and for students in inner-city schools. The cost effectiveness of STAR was less clearcut, though: CSR was the most cost effective strategy for improving mathematics achievement, but CSR was the second most expensive approach to increasing reading achievement (only tutoring by adults was a more costly way of improving reading) (Cohen et al., 2000; Finn, 1998).

Follow-up studies were conducted in the late 1990s to determine whether STAR had long-term benefits for early participants. The educational outcomes for the STAR students who could be followed demonstrated lasting effects: as compared with non-STAR students, they took more advanced courses and were more likely to graduate with higher rankings, and they were less likely to be retained in grade or to drop out. Their lower grade retention rate saved Tennessee at least several million dollars (Pate-Bain, Fulton, & Boyd-Zaharias, 1999). It should be noted, however, that most of the studies indicated that the validity of their findings may be limited by the fact that they did not consider differences in teacher quality or instructional strategies, factors which can also affect student performance.

Wisconsin

In 1995 Wisconsin legislators passed the five-year pilot Student Achievement Guarantee in Education (SAGE) program. Eligible participants were school districts with at least one school serving a high-poverty student population. SAGE required participating districts to (1) reduce their K-3 classes to a student-teacher ratio of 15:1, (2) stay open extended hours, (3) develop rigorous academic curricula, and (4) implement staff development and professional accountability. An annual evaluation was also mandated (Sage Initiative Evaluation, 2002).

The achievement of SAGE students was determined by comparing their scores on several standardized tests administered in each grade with those of non-SAGE students in demographically similar comparison schools. On every test measure SAGE students outperformed the comparison students. The difference between African American SAGE and comparison students was the greatest. Overall, the negative effects of poverty were mitigated. When the student-teacher ratio exceeded 15:1, however, the SAGE student advantage decreased (Sage Initiative Evaluation, 2002).

The assessment of SAGE classrooms and schools was accomplished through teacher and principal questionnaires and interviews, and direct observation. Teachers provided more individualized instruction and attention, and had greater enthusiasm for their work. They also spent more time on instruction and less on discipline (Molnar, 2001). As with the California program (described below), benefits shown may result from factors other than CSR, however, since SAGE encompasses additional educational improvement elements that are not related to class size.

California

A voluntary program to reduce K-3 class size by one-third in California schools was created by legislation in 1996. One of many reforms designed to reverse the trend of low student achievement, it was expected to be as successful as STAR. However, California's student population was far larger than Tennessee's, required many more educational supports, was much more ethnically and racially diverse, and spoke more native languages. Even though parents report high satisfaction with the CSR initiative, the state is still struggling to find ways

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to make it more successful. Most problems have stemmed from the sheer size of California's CSR effort, which required the immediate hiring of thousands of new teachers and the addition of 18,000 classrooms. In fact, some schools declined to participate in the initiative because they were simply unable to meet its hiring and space requirements (Bohrnstedt & Stecher, 2002; Jepsen & Rivkin, 2002).

Overall conclusions about whether CSR has generated educational improvement have not yet been possible, although a variety of small studies have yielded some limited findings suggesting mixed results (Bohrnstedt & Stecher, 2002). For the young students in the smaller classes with high quality teachers, the advantages are clear. Moreover, the positive effects are greater in schools serving predominantly poor students. But, for African American students specifically, the benefits have been few, and California's goal of closing the achievement gap has yet to be unrealized (Bohrnstedt & Stecher, 2002; Jepsen & Rivkin, 2002; Stecher, Bohrnstedt, Kirst, McRobbie, & Williams, 2001).

In fact, racial and ethnic educational inequities among students may be exacerbated by CSR, as the burdens of implementation fall disproportionately on urban schools suffering from poverty, overcrowding, and language barriers, and the need to provide many special services (Jepsen & Rivkin, 2002). The possible positive effects attributable to smaller classes were often mitigated in these schools because teacher quality was lower than in other schools, as more experienced teachers left to fill new CSR openings in less troubled schools. Urban schools were left to fill not only the vacancies created by those who transferred out, but also the newly created CSR slots. They did so by hiring inexperienced and uncertified teachers, with the result that one-quarter of the black students in high poverty schools had a first- or second-year teacher, and nearly 30 percent had a teacher who was not fully certified (Jepsen & Rivkin, 2002).

Finding space for additional classes has also been a problem, as there has been inadequate funding for increasing the size or number of schools, and no available urban land on which to build. Thus, schools have had to convert gymnasiums and libraries to classrooms, resulting in the loss of important resources of benefit to all students. Even though a decrease in state revenues may translate into less support for CSR, and participating districts are facing budget shortfalls, program cutbacks are not anticipated. Indeed, researchers have generated an array of recommendations to improve the effects of CSR in California without significantly increasing its costs (Bohrnstedt & Stecher, 2002; Hertling et al., 2001; Stecher et al., 2001).

Recommendations for Maximizing the Benefits of Class Size Reduction

After evaluating the CSR efforts described above, and initiatives undertaken elsewhere, researchers have crafted recommendations to help assure that CSR will improve student achievement wherever it is implemented (Bohrnstedt & Stecher, 2002; Hertling et al., 2000; Jepsen & Rivkin, 2002; Stecher et al., 2001). Their recommendations include:

- CSR should be integrated with other school reforms, including standards-based policies.
- The accurate projection of direct and indirect costs is essential for making an informed decision about whether to implement CSR and then doing so fully, effectively, and without damage to other essential resources.
- The accurate assessment of staff needs—both the required number and qualifications of teachers—and classroom space needs should guide decisions about where and when to implement CSR. Strategies for meeting these needs should be implemented as an integral part of the CSR effort.
- CSR should be first implemented as a trial in selected districts—preferably in low-income areas and with large minority student populations—before a large-scale roll-out is attempted.
- Instructional strategies and classroom organization practices that work best in small classrooms should be identified, and CSR teachers should receive appropriate professional development to ensure that students receive the full benefits from CSR.
- Additional funds should be allocated for extra resources for students of color and with low income, including placement in even smaller classes.
- Strategies for program evaluation, which should include use of a data management system, should be developed as part of the implementation plan.

—Wendy Schwartz,
Teachers College, ColumbiaUniversity

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This Digest was developed by the ERIC Clearinghouse on Urban Education, with funding from the Office of Educational Research and Improvement, U.S. Department of Education, under contract no. ED-99-CO-0035. The opinions in this Digest do not necessarily reflect the position or policies of OERI or the Department of Education.

ERIC Clearinghouse on Urban Education, Institute for Urban and Minority Education, Box 40, Teachers College, Columbia University, New York, NY 10027, (800) 601-4868. Erwin Flaxman, Director. Wendy Schwartz, Managing Editor.
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